

T.Y.B.Sc. Semester-V and Semester-VI (NEP2020)

Course	Paper title	Code
Major Paper I	Structural Geology	GLM3005C
Major Paper II	Paleontology	GLM3015C
Major Paper III	Remote Sensing and GIS	GLM3025C
Minor Paper I	Stratigraphy and Precambrian geology of India	GLE3005C
Minor Paper II	Global Tectonics	GLE3015C
SEC	Field Geology	SEC3625C
Major Paper I	Groundwater and Engineering Geology	GLM3006C
Major Paper II	Ore Genesis and Economic Geology	GLM3016C
Major Paper III	Exploration and Mining Geology	GLM3026C
Minor Paper I	Stratigraphy and Phanerozoic geology of India	GLE3006C
SEC	Internship/ Course/ Project/ Fieldwork	SEC3436C
AEC	Analytical Techniques in Geoscience	AEC3396C

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Major Paper I: GLM3005C Structural Geology			CREDIT	4
Semester	I				HOURS	60
OBJECTIVES:		To understand and apply the principles of structural geology, including kinematic and dynamic analyses, types of stress and strain, and the interpretation of rock structures like folds, faults, and joints.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory				15 hrs.	
	Descriptive, kinematic and dynamic analyses; penetrative and non-penetrative structures, scale and symmetry of structures, tectonites; Types of stress and strain, stress at a point, stress matrix, Mohr circle of stress, strain markers, Flinn and Ramsay diagrams; Types of planar and linear structures and their utility in structural analyses; Rock cleavages - types and geometrical relations with folds.					
UNIT-II	Theory				15 hrs.	
	Folds – structural elements of folds, qualitative description of folds, morphological classification (Ramsay classification) of folds, outcrop patterns; Mechanisms of folding, Interfering folds; Unconformities – types, basement cover relationship.					
UNIT-III	Theory				15 hrs.	
	Faults – terminology and classification; Anderson theory of faulting, effects of faulting on topography and outcrops, criteria for identification of faults; Joints – types and geometrical relation with folds and faults; Introduction to deformation bands.					
UNIT-IV	Practical				15 hrs.	
	Geological Maps – study of outcrop patterns; Interpretation and construction of cross- sections. Three-point problems, stereographic and orthographic projections.					
REFERENCES						
1.	Ghosh, S. K. (2013). Structural geology: Fundamentals and modern developments. Elsevier.					
2.	Billings, M. P. (1972). Structural geology. Prentice Hall of India Pvt. Ltd.					
3.	Fossen, H. (2016). Structural geology. Cambridge university press.					
4.	Davis, G. H., Reynolds, S. J., & Kluth, C. F. (2011). Structural geology of rocks and regions. John Wiley and Sons.					
5.	Ramsay J. G. (1967), Folding and fracturing of Rocks, McGraw Hill Pub.					
6.	Ramsay J.G. and Huber M. I., (1983). The Techniques of Modern Structural Geology, Strain Analysis, Academic Press.					
7.	G.W.Chiplonkar (1962) Geological Maps. Dastane Ramchandra & Co. Pune.					
8.	Marshak, S., & Mitra, G. (1988). Basic methods of structural geology.					

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Major Paper II: GLM3015C Paleontology			CREDIT	4
Semester	I				HOURS	60
OBJECTIVES:		To understand the theories of life's origin, mechanisms of evolution, and the factors influencing faunal distribution, along with the classification and geological distribution of various plant and animal groups.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory				15 hrs.	
	Theories of origin of life; Mechanism and patterns of evolution; Factors affecting faunal distribution and dispersal; Causes of Mass Extinction; Classification of organisms and taxonomic hierarchy; Morphology and geological distribution of vascular and nonvascular plants.					
UNIT-II	Theory				15 hrs.	
	Morphology, classification and geological distribution of Trilobita, Graptolites and Brachiopoda, Mollusca (Bivalvia, Gastropoda, and Cephalopoda), Echinoidea and Cnidaria; Morphology and geological distribution of fish, amphibians, reptiles, birds, and mammals, Extinction of dinosaurs; Human evolution.					
UNIT-III	Practical				15 hrs.	
	Study of Modes of preservation of fossils; Morphology and geological history of invertebrate fossil groups (Brachiopoda, Mollusca)					
UNIT-IV	Practical				15 hrs.	
	Morphology and geological history of invertebrate fossil groups (Trilobita, Graptolite, Echinoidea and Cnidaria); Important Plant and vertebrate fossils.					
REFERENCES						
1.	Black, R. M. (1999) Elements of Palaeontology, Cambridge University Press.					
2.	Clarkson E. N. K (1986) Invertebrate paleontology and evolution. Allen & Unwin, London					
3.	Jain P. C. and M.S. Anantharaman (2017) An Introduction to Palaeontology. Evolution and Animal Distribution. Vishal Publishing Company, Jalandhar-Delhi					
4.	Wood, H. (1961) Invertebrate Palaeontology. International Book Bureau Hyderabad.					
5.	Shrock R. R. and Twenhofel W. H. (1987) Principles of Invertebrate Palaeontology CBS Publishers and Distributors.					
6.	Jain, S. (2020). Fundamentals of Invertebrate Palaeontology. Springer India.					

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Major Paper III: GLM3025C Remote Sensing and GIS			CREDIT	4
Semester	I				HOURS	60
OBJECTIVES:		To understand the principles of photogeology, remote sensing, and GIS, including energy interactions, data acquisition, image interpretation, and applications in Earth sciences.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory				15 hrs.	
	Photogeology; Aerial photographs-Types and Geometry, Normal vision and depth perception, Stereoscopic vision - vertical exaggeration and factors affecting vertical exaggeration; Concept of remote sensing, EM-spectrum, energy sources and radiation principles; energy interaction in the atmosphere (atmospheric effects in remote sensing); energy interactions with earth surface features; spectral reflectance curve of vegetation, soil and water; spectral response patterns; data acquisition and image interpretation; ideal and real remote sensing system.					
UNIT-II	Theory				15 hrs.	
	Applications of remote-sensing in earth sciences; Introduction to GIS-Types of GIS; Geographical data representation – discrete and continuous data; GIS data models – raster, vector, attributes; Introduction to projections systems, spatial analysis – vector and raster- based analysis; Introduction to Digital Elevation Model (DEM).					
UNIT-III	Practical				15 hrs.	
	Marginal information of satellite data, Identification of tone and texture from satellite data, visual image interpretation of satellite data with reference to structural geological and geomorphological features.					
UNIT-IV	Practical				15 hrs.	
	Preparation of land use and land cover, lineament and hydro geomorphological maps using satellite data and exercises on google earth.					
REFERENCES						
1.	Leuder, D. R. Aerial photographic interpretation: Principles and Interpretation.					
2.	Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). Remote sensing and image interpretation. John Wiley & Sons.					
3.	Curran, P. J. (1988) Principles of remote sensing.					
4.	Miller, V.C. & Miller, C.F. Photogeology. McGraw Hill Pub. New York.					
5.	Gupta, R. P. (2017). Remote sensing geology. Springer.					
6.	Bhatta, B. (2008). Remote sensing and GIS (Vol. 2). New Delhi: Oxford University Press.					
7.	Misra, A. A., & Mukherjee, S. (Eds.). (2022). Atlas of Structural Geological and Geomorphological Interpretation of Remote Sensing Images. John Wiley & Sons.					

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Minor Paper I: GLE3005C Stratigraphy and Precambrian geology of India			CREDIT	4
Semester	I				HOURS	60
OBJECTIVES:		To study the geological evolution of the Earth during the Precambrian, including crustal evolution, glaciations, and tectonic subdivisions of India, focusing on the structural and stratigraphic framework of major Indian cratons and sedimentary basins.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory				15 hrs.	
	Stratigraphic correlation based on physical and paleontological evidences; Vertical succession, lateral variation and facies concept; Graphic representation of stratigraphic data; Stratigraphic maps; International code of stratigraphic nomenclature of lithostratigraphy, biostratigraphy, chronostratigraphy and magnetostratigraphy; Stratotypes-types and guidelines for designating Stratotypes [Global Stratotype Section and Point (GSSP)]; GSSP of Precambrian-Cambrian boundary.					
UNIT-II	Theory				15 hrs.	
	Divisions of Precambrian supereon; Geological evolution of the earth during Precambrian - crustal evolution, oxygen catastrophe and BIF; Neoproterozoic glaciations and snowball earth hypothesis; Archean and Proterozoic life; Physiography, drainage and tectonic subdivisions of Indian subcontinent; Structure, tectonics and Precambrian stratigraphy of the Himalayas; Structure and tectonics of the Peninsular India- Cratons, shields, platforms, mobile belts and shear zones.					
UNIT-III	Theory				15 hrs.	
	Structural framework, stratigraphy, and geological evolution of Aravalli-Delhi fold belt, Southern Aravalli Mountain belt, Dharwar craton, Southern Granulite Terrane, Singhbhum Craton, Eastern Ghats Mobile Belt, Bastar Craton and Bundelkhand Craton.					
UNIT-IV	Theory				15 hrs.	
	Structural framework, stratigraphy, and geological evolution of Proterozoic sedimentary basins of India- Vindhyan, Cuddapah, Chhattisgarh, Kaladgi, Pakhal and Bhima basins; Economical importance of Precambrian formations.					
REFERENCES						
1.	Ramakrishnan, M., & Vaidyanadhan, R. (2008). Geology of India (Vol 1 and 2), Geological Society of India.					
2.	Valdiya, K. S. (2010) The making of India, Macmillan India Pvt. Ltd					
3.	Sharma, R. (2009). Cratons and fold belts of India (Vol. 127). Springer.					
4.	Wadia, D. N.(1978) Geology of India, Tata McGraw Hill.					
5.	Krishnan, M. S. (1982) Geology of India and Burma, CBS Publishers, Delhi					
6.	Weller J. M. (1960) Stratigraphic Principles and Practice, UBS Publications.					
7.	Salvador, A. (Ed.). (1994). International stratigraphic guide: a guide to stratigraphic classification, terminology, and procedure (No. 30). Geological Society of America.					
8.	Doyle, P., & Bennett, M. R. (Eds.). (1998). Unlocking the stratigraphical record: advances in modern stratigraphy. John Wiley & Sons					
9.	https://stratigraphy.org					

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Minor Paper II: GLE3015C Global Tectonics			CREDIT	4
Semester	I				HOURS	60
OBJECTIVES:		To explore the dynamics of plate tectonics, including plate motions, divergent, convergent, and transform boundaries, orogenic belts, and the tectonic history of the Indian plate, with an understanding of hotspots, mantle convection, and supercontinent cycles.				
COURSE CONTENT / SYLLABUS						
UNIT-I		Theory			15 hrs.	
		Origin of the planetary system; Seismic waves; Composition of the earth; Lithosphere and asthenosphere; Gravity anomalies; Earth’s magnetic field and paleomagnetism; Continental drift and seafloor spreading theories and their evidences; Concept of geosyncline.				
UNIT-II		Theory			15 hrs.	
		Introduction to plate tectonics- Macro and micro plates, distribution of plates; Plate motions- relative and absolute methods; Divergent Plate Boundaries- Mid Oceanic ridges (morphology and spreading rate, petrology of MOR, origin of oceanic crust); Continental rifts (characteristic, structure and origin).				
UNIT-III		Theory			15 hrs.	
		Convergent plate boundary- trenches, accretionary prism, volcanic and island arcs; Transform Boundary- Transform and transcurrent faults; Orogenic belts- Ocean-continent convergence, continent-continent collision and arc-continent collision; Forces acting on plates.				
UNIT-IV		Theory			15 hrs.	
		Concept of hotspot and triple junction; Mantle convection and plumes; Precambrian and phanerozoic supercontinents and supercontinent cycles; Tectonic history of the Indian plate.				
REFERENCES						
1.	Kearey, P., Klepeis, K. A., & Vine, F. J. (2009). Global tectonics. John Wiley & Sons. Oxford					
2.	Condie, K. C. (2013). Plate tectonics & crustal evolution. Elsevier.					
3.	Cox, A., & Hart, R. B. (1991). Plate tectonics: How it works. John Wiley & Sons.					
4.	Le Pichon, X., Francheteau, J., & Bonnin, J. (2013). Plate tectonics (Vol. 6). Elsevier					
5.	Fossen, H., & Tevssier, C. (2024). Plate Tectonics. Cambridge: Cambridge University Press					

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26	
B.Sc. Geology: Regular (NEP 2020)					
YEAR	III	SEC: SEC3625C Field Geology		CREDIT	2
Semester	I			HOURS	30
OBJECTIVES:		To develop skills in planning and executing a geological field project, including literature review, map interpretation, field equipment usage, geological mapping, and field documentation, while ensuring safety and producing a technical report.			
COURSE CONTENT / SYLLABUS					
UNIT-I		Theory		15 hrs.	
		Planning of field project – Literature review, topographical maps, and geological maps; Essential field equipments – Brunton compass and clinometer, geological hammers; Overview and principle/working/functioning of GPS; Concept of true thickness and vertical thickness; Determination of top & bottom of beds			
UNIT-II		Theory		15 hrs.	
		Basic concepts of geological mapping in igneous, sedimentary, and metamorphic terrains; Sampling methods; Field documentation – field diary, sketches, logs, block diagrams, photographs; Measuring and recording attributes of various planar and linear features; Safety in geological fieldwork; Writing of technical report; Outdoor practical in various geological terrains.			
REFERENCES					
1.	Mathur, S. M. (2001). Guide to Field Geology. PHI Learning Pvt. Ltd.				
2.	N. W. Gokhale, (2001). A Guide to Field Geology, CBS Publishers.				
3.	Compton, R. R., & Compton, R. R. (1985). Geology in the Field. New York: Wiley.				
4.	McCann, T. (2021). Pocket Guide Geology in the Field. Springer.				
5.	T. Freeman. (1999). Procedures in Field Geology, Blackwell Science				

	The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology			ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Major Paper I: GLM3006C Groundwater and Engineering Geology			CREDIT	4
Semester	II				HOURS	60
OBJECTIVES:		To understand the key concepts of groundwater, including aquifer properties, recharge, flow dynamics, and pollution, as well as to apply engineering principles in geological investigations for construction materials, environmental impact assessments, and groundwater modelling.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory				15 hrs.	
	Aquifer and its properties – Porosity, Permeability, Transmissivity, Specific Yield, Specific retention and Storativity; Hydraulic conductivity; Isotropy and homogeneity of aquifers; Darcy’s law; Groundwater potential and hydraulic head; Concept of groundwater flow direction - water table and potentiometric surface maps; Springs and its classification; Influent and effluent streams.					
UNIT-II	Theory				15 hrs.	
	Concept of groundwater recharge - direct and indirect methods; Methods of groundwater investigation; Groundwater quality criteria; Groundwater pollution; Concept of seawater intrusion- prevention and control.					
UNIT-III	Theory				15 hrs.	
	Soils as foundation and construction material; Engineering properties of rocks; Rock mass classification BGD and RQD; Engineering properties of soils and unified soil classification; Geological consideration in the construction of dams, tunnels, roads and bridges; Environmental Impact Assessment of Engineering projects.					
UNIT-IV	Practical				15 hrs.	
	Exercises on estimation of rainfall through various methods, groundwater flow, hydrogeological cross-sections, hydrochemical data representation; Numerical problems on porosity, permeability, specific yield, storativity, pore velocity, Reynold’s number, hydraulic gradient, Darcy’s law. Basic numerical groundwater modelling.					
REFERENCES						
1.	Attewell P B and Farmer J W (1976) Principles of engineering Geology; Chapman & Hall.					
2.	Bell F G (1983) Fundamentals of engineering geology; Butterworths, London.					
3.	Davis, S N and Dewiert R J M (1974) Hydrogeology, John Wiley & sons.					
4.	Farmer, I. W. (1968) Engineering properties of rocks; E & EN Spon-ltd.					
5.	Karanth. K. R. (1989) Introduction to Hydrogeology. McGraw Hills Book Co. New Delhi.					
6.	Todd, D. K. (1962) Groundwater Hydrology, John Wiley and sons.					
7.	Rao, N. S. (2016). Hydrogeology: problems with solutions. PHI Learning Pvt. Ltd..					

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Major Paper II: GLM3016C Ore Genesis and Economic Geology			CREDIT	4
Semester	II				HOURS	60
OBJECTIVES:		To explore the formation, classification, and distribution of ore deposits, with an emphasis on their genesis, controls, and relation to plate tectonics, and to develop skills in the study of ore minerals and reserve estimation in India.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory				15 hrs.	
	Ores and gangue minerals; Structure and texture of ore deposits, concordant and discordant ore bodies; Metallogenic provinces and epochs; Controls of mineral localization; Ore deposits in relation to plate tectonics; Fluid inclusions in ore.					
UNIT-II	Theory				15 hrs.	
	Processes of formation of mineral deposits- Magmatic concentration, sublimation, contact metasomatism, hydrothermal, sedimentation, oxidation and supergene enrichment, volcanogenic massive sulphides, evaporation, residual and mechanical concentration, and metamorphism.					
UNIT-III	Theory				15 hrs.	
	Genesis and distribution of ore minerals in India - Precious (Gold, Silver, Platinum), Metallic (Iron, Manganese, Chromium, Copper, Lead, Zinc, Aluminum, Magnesium, Tin, Tungsten), Non-metallic (Diamond and Gemstones), Radioactive (Uranium and Thorium) and important rare earth mineral resources; Occurrence and distribution of beach and placer deposits, coal and petroleum, ceramic, refractory, and fertilizer minerals.					
UNIT-IV	Practical				15 hrs.	
	Megascopic and microscopic study of Metallic and non-metallic ore minerals. Exercises on assessment of ore grade and reserve estimation.					
REFERENCES						
1.	Cuilbert, J.M. and Park,Jr. C.F.(1986): The Geology of Ore Deposits, Freidman					
2.	Laurence Robb. Introduction to Ore-Forming Processes.: Blackwell Publishing.					
3.	Evans, A.M. (1993): Ore Geology and Industrial Minerals, Blackwell Publishing.					
4.	Vaughan, D. J., & Craig, J. R. (1994). Ore microscopy and ore petrography. John Wiley & Sons Ltd.					
5.	Klemm, D.D. and Schnieder, H.J. (1977): Time and Strata Bound Ore Deposits, Springer- Verlag.					
6.	Mookherjee, A. (2000): Ore Genesis-A Holistic Approach, Allied Publisher.					
7.	Ramdhor, P. (1969): The Ore Minerals and their Intergowths, Pergamon Press.					
8.	Stanton, R.L. (1972): Ore Petrology, McGraw Hill.					
9.	Wolf. K.H. (1976-1981): Hand-Book of Stratabound and Stratiform Ore Deposits. Elsevier Publ.					

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology			ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)							
YEAR	III	Major Paper III: GLM3026C Exploration and Mining Geology				CREDIT	4
Semester	II					HOURS	60
OBJECTIVES:		To understand the stages and methods of mineral exploration, including geophysical and geochemical techniques, and to apply geological principles in mining operations, safety, and environmental impact assessments.					
COURSE CONTENT / SYLLABUS							
UNIT-I		Theory				15 hrs.	
		Stages of exploration; Mineral prospecting; Lieses, licences and permits; Types of discovery; Geological criteria, guides, and indicators for mineral exploration. Concepts of resources and reserves; UNFC classification; Geochemical methods, mobility, and geochemical associations of elements.					
UNIT-II		Theory				15 hrs.	
		Geophysical exploration methods - Gravity, Magnetic, Seismic, Electrical. Basics of logging. Drilling techniques. Sampling methods. Use of remote sensing in mineral exploration.					
UNIT-III		<u>Theory</u>				15 hrs.	
		Types of mines and various mine workings. Safety measures in mining. Geological considerations for selection of mining method; Surface mining methods - Mechanical excavation and aqueous mining; Underground mining methods for metallic and non-metallic minerals, and coal; Mining machinery; Mine planning and ventilation. Mine development; Methods of shaft sinking. Environmental impacts of mining.					
UNIT-IV		Practical				15 hrs.	
		Survey-based exercises. Understanding and interpretation of remote sensing data for mineral exploration. Interpretation of borehole data and fence diagrams. Calculation of average assay value by using sampling data obtained by drilling and by sampling in underground mine workings.					
REFERENCES							
1.	Halder, S., K., Mineral Exploration: Principles and Applications, Elsevier						
2.	Hartman and Mutmansky, Introductory Mining Engineering, Wiley						
3.	P.K. Banerjee and S Ghosh (1997): Elements of prospecting for non-fuel mineral deposits.						
4.	Bagchi, T.C., Sengupta, D.K., Rao, S.V.L.N. (1979): Elements of Prospecting and Exploration.						
5.	Sinha, R.K. and Sharma, N.L. (1976) Mineral Economics.						
6.	McKinstry, H.E. Mining Geology, Prentice Hall, Englewood Cliffs, N.J.						
7.	Clark, G.B. (1967) Elements of Mining, III ed. John Wiley.						
8.	Arogyaswami, R.P.N. (1996) Courses in Mining Geology, IV Ed. Oxford IBH.						
9.	Thomas, L.J. (1978) An Introduction to Mining, Methuen, Brisbane.						
10.	Evans, A.M. Introduction to Mineral Exploration. Blackwell Science, Oxford, 1995						

		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	Minor Paper I: GLE3006C Stratigraphy and Phanerozoic geology of India			CREDIT	4
Semester	II				HOURS	60
OBJECTIVES:		To study the geological history, paleogeography, and significant stratigraphic boundaries of the Palaeozoic, Mesozoic, and Cenozoic eras, with a focus on Indian Mesozoic successions, volcanic provinces, and the tectonic evolution of the Indian plate.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory Geological history, life; Paleoenvironment and paleogeography of the Paleozoic, Mesozoic and Cenozoic eras; Major stratigraphic boundaries- concept, geological events, extinction and GSSP of Permian-Triassic boundary, Cretaceous-Tertiary boundary, Neogene-Quaternary boundary and Pleistocene-Holocene boundary.				15 hrs.	
UNIT-II	Theory Geological history, life; Paleoenvironment and paleogeography of the Paleozoic, Mesozoic and Cenozoic eras; Major stratigraphic boundaries- concept, geological events, extinction and GSSP of Permian-Triassic boundary, Cretaceous-Tertiary boundary, Neogene-Quaternary boundary and Pleistocene-Holocene boundary.				15 hrs.	
UNIT-III	Theory Detailed study of important Mesozoic successions in India with emphasis on structural and tectonic set up, lithology, stratigraphy and paleo-environment of the Spiti, Kachchh, Saurashtra, Rajasthan; Cauvery and Narmada basins; Volcanic Provinces of India- Deccan Volcanic Province, Rajmahal and Sylhet Traps.				15 hrs.	
UNIT-IV	Theory Concept of hotspot and triple junction; Mantle convection and plumes; Precambrian and phanerozoic supercontinents and supercontinent cycles; Tectonic history of the Indian plate.				15 hrs.	
REFERENCES						
1.	Ramakrishnan, M., & Vaidyanadhan, R. (2008). Geology of India (Vol 1 and 2), Geological Society of India.					
2.	Krishnan, M. S. (1982) Geology of India and Burma, CBS Publishers, Delhi					
3.	Salvador, A. (Ed.). (1994). International stratigraphic guide: a guide to stratigraphic classification, terminology, and procedure (No. 30). Geological Society of America.					
4.	Doyle, P., & Bennett, M. R. (Eds.). (1998). Unlocking the stratigraphical record: advances in modern stratigraphy. John Wiley & Sons					
5.	https://stratigraphy.org					

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B.Sc. Geology: Regular (NEP 2020)					
YEAR	III	SEC3436C Internship/ Course/ Project/ Fieldwork		CREDIT	4
Semester	II			HOURS	60
OBJECTIVES:		The outcome of this course is aimed to focus on the applications of geological knowledge and hands on training by working in different industries and terrains.			
COURSE CONTENT / SYLLABUS					
UNIT-I	<<Title>>				15 hrs.
UNIT-II	<<Title>>				15 hrs.
UNIT-III	<<Title>>				15 hrs.
UNIT-IV	<<Title>>				15 hrs.
REFERENCES					
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		The Maharaja Sayajirao University of Baroda Faculty of Science Department of Geology		ACADEMIC YEAR 2025-26		
B.Sc. Geology: Regular (NEP 2020)						
YEAR	III	AEC: AEC3396C Analytical Techniques in Geoscience			CREDIT	2
Semester	II				HOURS	30
OBJECTIVES:		To understand the principles, applications, and limitations of advanced analytical techniques in geology, such as XRD, SEM-EDX, ICPMS, and isotopic dating, while gaining practical experience in sample processing, data interpretation, and case studies.				
COURSE CONTENT / SYLLABUS						
UNIT-I	Theory				15 hrs.	
	Principles, applications and limitations of XRD, Petrographic microscope, SEM-EDX, EPMA, AAS, ICPMS- ICPOES, XRF, Granulometric analysis, hydrometric methods, Permeameter, Multi-parametric meter, Ion & gas chromatography, Isotope ratio mass spectrometer, OSL dating, Fourier transform infrared spectroscopy, Total environment analysis.					
UNIT-II	Practical				15 hrs.	
	Case studies and hands-on training in sample processing, analytical methods and interpretation of data.					
REFERENCES						
1.	Rollinson, H. R. (2014). Using geochemical data: evaluation, presentation, interpretation. Routledge.					
2.	Carver, R. E. (1971). Procedures in sedimentary petrology.					
3.	Folk, R. L. (1980). <i>Petrology of sedimentary rocks</i> . Hemphill publishing company.					
4.						
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